

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group
Art Unit: Unknown

Attorney
Docket No.: SHC0139

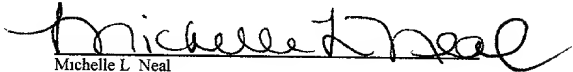
Applicant: Toshiya Yagou et al.

Invention: BODY FLUID ABSORBENT PANEL
FOR SANITARY WEARING ARTICLE

Serial No: Unknown

Filed: Herewith

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PRELIMINARY AMENDMENT

Box Patent Application
Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Prior to the examination of the above-identified application, please amend the application as follows:

IN THE SPECIFICATION

Please replace the first full paragraph on page 3 with the following:

- -According to this invention the barrier comprises a shape keeping layer formed with a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer placed upon one of an upper surface and a lower surface of the shape keeping layer and formed with a plurality of thermoplastic synthetic resin fibers mixed with absorbent material, and the synthetic resin fibers are hot welded together at contact points of these fibers in the shape keeping layer and in the body fluid retaining layer and, along an interface of the shape keeping layer and the body

fluid regaining layer, the synthetic resin fibers of these layers are hot welded together at contact points of these fibers. As used herein, the term "compression resilience" refers to a property that a fibrous web can be compressed and restored in a direction of its thickness as resiliently as rubber or soft urethane foam.- -

Please replace the second full paragraph on page 4 with the following:

- (3) At least the two panels are placed upon each other in the direction of thickness so that each of the openings formed in an upper one of the panels is divided by the barrier formed in the panel immediately underlying the upper one of the panels at least in two sections.- -

Please replace the last paragraph beginning on page 7 and continuing on page 8 with the following:

- Each of the openings 2 is defined by a pair of the adjacent first barriers 3a and a pair of the adjacent second barriers 3b intersecting said pair of the adjacent first barriers 3a. In the panel 1, the openings 2 of the first panel 1A are out of coincidence with the openings 2 of the second panel 1B so that each of the openings 2 in the first panel 1A may be divided by the first and second barriers 3a, 3b of the second panel 1B in a plurality of sections, including at least in two sections. In the panel 1, a total area occupied by the openings 2 in the first panel 1A and a total area occupied by the openings 2 in the second panel 1B are in a relationship of the first panel < the second panel.- -

Please replace the last paragraph beginning on page 9 continuing on page 10 with the following:

--The shape keeping layer L1 particularly comprising the synthetic resin fibers presents

a higher resistance to the pressure than the body fluid retaining layer L2 and has a compression resilience. In this manner, a resistance of the barrier 3 against the pressure as well as a restorative elasticity after compression of the barrier 3 can be reliably achieved. In the body fluid retaining layer L2, on the other hand, it is less likely that the polymer particles might fall off from the body fluid retaining layer L2 even if the barrier 3 is collapsed since the synthetic resin fibers and the polymer particles are hot welded at the contact points thereof.- -

Please replace the last paragraph beginning on page 13 and continuing on page 14 with the following:

- -The synthetic resin fibers used to implement this invention may be selected from a group including fibers made of a polyolefin such as a polypropylene or a polyethylene, fibers made of a polyester such as a polyethylene terephthalate or a polybutylene terephthalate, fibers made of a polyamide such as a nylon 66 or a nylon 6, or acryl fibers. It is also possible to use core-sheath-type conjugated fibers or side-by-side-type conjugated fibers of a polyethylene/a polypropylene or a polyester as said synthetic resin fibers. The synthetic resin fibers are preferably treated to make them hydrophilic. The body fluid retaining layer may contain, in addition to the fluff pulp, cellulose-based fibers such as rayon or acetate fibers.- -

Please replace the last paragraph beginning on page 18 and continuing on page 19 with the following:

- -The topsheet 11 may be formed from a liquid-pervious sheet such as a nonwoven fabric or a porous plastic film, preferably with a liquid-pervious hydrophilic sheet. The backsheet 12 and the leak-proof sheets 14 may be formed from a hydrophobic nonwoven fabric, a liquid-impervious plastic film or a laminated sheet of a hydrophobic nonwoven fabric and a plastic film,

preferably with a breathable but liquid-impervious sheet. It is also possible to form the backsheet and the leak-barrier sheets using composite nonwoven fabric consisting of a melt blown nonwoven fabric having a high water-resistance and two layers of a spun bond nonwoven fabric having high strength and flexibility sandwiching the melt blown nonwoven fabric.- -

Please replace the first full paragraph on page 19 with the following:

- -The nonwoven fabric may be selected from a group including spun lace-, needle punch-, melt blown-, thermal bond-, spun bond-, chemical bond- and air through-nonwoven fabrics. Component fiber of the nonwoven fabric may be selected from a group including polyolefin-, polyester- and polyamide-based fibers and polyethylene/polypropylene or polyethylene/polyester core-sheath type conjugated fiber and side-by-side-type conjugated fiber.- -

Please replace the last paragraph beginning on page 20 and continuing on page 21 with the following:

- -According to the body fluid absorbent panel of the present invention, the barrier comprises the shape keeping layer in which the synthetic resin fibers are hot welded together at contact points of these fibers and the body fluid retaining layer in which the synthetic resin fibers are hot welded together at contact points of these fibers. This unique arrangement ensures the synthetic resin fibers to restrict themselves against any relative movement of these fibers so that the layers may be prevented from being collapsed. Even when these layers are more or less collapsed under a pressure exerted thereon in their thickness directions, the layers can restore their initial thickness. If the panel has not an adequate compression modulus to restore a desired thickness dimension after it has been collapsed, the volume of the barrier would be unacceptably reduced and its absorbing capacity for body fluids such as loose passage or menstrual discharge

would be correspondingly reduced. The panel according to this invention effectively solves this problem by the unique construction of the barrier which is not readily collapsed and, even when it has been more or less collapsed, able to restore a sufficient thickness dimension to maintain a desired absorbing capacity for body fluids.- -

IN THE CLAIMS

Please amend Claim 1 as follows:

1. (Amended) A body fluid absorbent panel for a sanitary wearing article comprising a fibrous web having a compression resilience, said fibrous web comprising a plurality of openings extending therethrough in a direction of a thickness of the fibrous web, and barriers surrounding and defining said openings,

said barriers comprising a shape keeping layer formed from a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer placed upon one of an upper surface and a lower surface of said shape holding layer and formed from a plurality of thermoplastic synthetic resin fibers mixed with an absorbent material,

said synthetic resin fibers being hot welded together at contact points thereof in said shape keeping layer as well as in said body fluid retaining layer and said synthetic resin fibers of said shape keeping layer and said body fluid retaining layer being hot welded together along an interface at contact points of said synthetic resin fibers.

Please amend Claim 2 as follows:

2. (Amended) The body fluid absorbent panel according to Claim 1, wherein said absorbent material comprises a hot weldable high absorbent polymer component in the form of at least one of high absorption polymer particles and a plurality of liquid-absorbent fibers made

of high absorption polymer, said synthetic resin fibers and said high absorbent polymer component being hot welded together at contact points thereof in said body fluid retaining layer and said synthetic resin fibers of said shape keeping layer and said high absorbent polymer component of said body fluid retaining layer being hot welded together at contact points thereof along said interface of said shape keeping layer and said body fluid retaining layer.

Please amend Claim 3 as follows:

3. (Amended) The body fluid absorbent panel according Claim 1, wherein said barriers comprises a plurality of first barriers extending in parallel to and spaced apart from one another in a first direction and a plurality of second barriers extending in parallel to and spaced apart from one another in a second direction intersecting said first barriers and each of the openings is defined by a pair of adjacent first barriers and a pair of adjacent second barriers intersecting a pair of adjacent first barriers.

Please amend Claim 4 as follows:

4. (Amended) The body fluid absorbent panel according to Claim 1, comprising at least two of said panels which are placed upon each other in a thickness direction so that openings formed in upper one of said panels are divided by at least in two sections by barriers formed in a panel immediately underlying said upper one of said panels.

Please amend Claim 5 as follows:

5. (Amended) The body fluid absorbent panel according to Claim 1, wherein an open area ratio of said openings to said panel is in a range of from about 20 to about 80% and a total area of said openings is in a range of from about 10 to about 1600 mm².

Please amend Claim 6 as follows:

6. (Amended) The body fluid absorbent panel according to Claim 1, wherein a compression resilience of said barriers is in a range of from about 20 to about 80%.

Please amend Claim 7 as follows:

7. (Amended) The body fluid absorbent panel according to Claim 1, wherein a ratio between said shape keeping layer and said body fluid retaining layer with respect to a dimension of said barriers as measured in its thickness direction is in a range of 6:4 to 8:2.

Claim 8 remains unchanged.

Please amend Claim 9 as follows:

9. The body fluid absorbent panel according to Claim 1, wherein a mat-like liquid-absorbent core substantially without any openings is provided on a lower surface of said panel.

Please add new Claim 10 as follows:

- -10. The body fluid absorbent panel according to Claim 4, wherein an open area ratio of said openings to said panel is in a range of from about 20 to about 80% and a total area of said openings is in a range of from about 10 to about 1600 mm² and wherein a total area of said openings in said upper panel are less than or equal to a total area of said openings in the panel immediately underlying said upper panel.- -

Please add new Claim 11 as follows:

- 11. The body fluid absorbent panel according to Claim 1, wherein a mat-like liquid-absorbent core substantially without any openings is provided on a lower surface of a lowermost one of said panels.- -

IN THE ABSTRACT

Please amend the abstract as follows:

- A body fluid absorbent panel including openings and a barrier which comprises, in turn, a shape keeping layer formed with a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer formed with a plurality of thermoplastic synthetic fibers mixed with an absorbent material. The synthetic resin fibers are hot welded together at contact points of these fibers in the shape keeping layer as well as in the body fluid retaining layer. The synthetic resin fibers of the shape keeping layer and the body fluid retaining layer are also hot welded together at contact points of these fibers along an interface of the shape keeping layer and the body fluid absorbent layer.- -

• • • R E M A R K S • • •

By the present Preliminary Amendment, the specification, claims and abstract have been revised to more clearly describe applicants' invention in accordance with the requirements of 35 U.S.C. § 112.

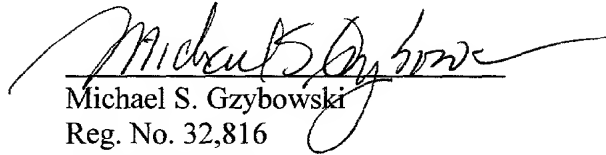
Care has been taken so as to avoid the addition of new matter in the specification and claims.

Entry of the present Preliminary Amendment prior to the examination of the application is respectfully requested.

In the event applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, applicants hereby petition

therefor and authorize that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Changes Made to Specification Paragraphs

The first full paragraph on page 3 has been amended as follows:

[The improvement according] According to this invention [is in that] the barrier comprises a shape keeping layer formed with a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer placed upon one of an upper surface and a lower surface of the shape keeping layer and formed with a plurality of thermoplastic synthetic resin fibers mixed with absorbent material, and the synthetic resin fibers are hot welded together at contact points of these fibers in the shape keeping layer and in the body fluid retaining layer and, along an interface of the shape keeping layer and the body fluid regaining layer, the synthetic resin fibers of these layers are hot welded together at contact points of these fibers. As used herein, the term "compression resilience" refers to a property that a fibrous web can be compressed and restored in a direction of its thickness as resiliently as rubber or soft [urethan] urethane foam.

The second full paragraph on page 4 has been amended as follows:

(3) At least the two panels are placed upon each other in the direction of thickness so that each of the openings formed in an upper one of the panels is divided by the barrier formed in the panel immediately underlying the upper one of the panels at least in two sections.

The last paragraph beginning on page 7 and continuing on page 8 has been amended as follows:

Each of the openings 2 is defined by a pair of the adjacent first barriers 3a and a pair of the adjacent second barriers 3b intersecting said pair of the adjacent first barriers 3a. In the panel 1, the openings 2 of the first panel 1A are out of coincidence with the openings 2 of the second

panel 1B so that each of the openings 2 in the first panel 1A may be divided by the first and second barriers 3a, 3b of the second panel 1B in a plurality of sections, including at least in two sections. In the panel 1, a total area occupied by the openings 2 in the first panel 1A and a total area occupied by the openings 2 in the second panel 1B are in a relationship of the first panel < the second panel.

The last paragraph beginning on page 9 continuing on page 10 has been amended as follows:

The shape keeping layer L1 particularly comprising the synthetic resin fibers presents a higher resistance to the pressure than the body fluid retaining layer L2 and has a compression resilience. In this manner, a resistance of the barrier 3 against the pressure as well as a restorative elasticity after compression of the barrier 3 can be reliably [improved] achieved. In the body fluid retaining layer L2, on the other hand, it is less likely that the polymer particles might fall off from the body fluid retaining layer L2 even if the barrier 3 is collapsed since the synthetic resin fibers and the polymer particles are hot welded at the contact points thereof.

The last paragraph beginning on page 13 and continuing on page 14 has been amended as follows:

The synthetic resin fibers used to implement this invention may be selected from a group including fibers made of a [polyolefine] polyolefin such as a polypropylene or a polyethylene, fibers made of a polyester such as a polyethylene terephthalate or a polybutylene terephthalate, fibers made of a polyamide such as a nylon 66 or a nylon 6, or acryl fibers. It is also possible to use core-sheath-type conjugated fibers or side-by-side-type conjugated fibers of a polyethylene/a polypropylene or a polyester as said synthetic resin fibers. The synthetic resin fibers are

preferably treated to make them hydrophilic. The body fluid retaining layer may contain, in addition to the fluff pulp, cellulose-based fibers such as rayon or acetate fibers.

The last paragraph beginning on page 18 and continuing on page 19 has been amended as follows:

The topsheet 11 may be formed [with] from a liquid-pervious sheet such as a nonwoven fabric or a porous plastic film, preferably with a liquid-pervious hydrophilic sheet. The backsheet 12 and the leak-proof sheets 14 may be formed [with] from a hydrophobic nonwoven fabric, a liquid-impervious plastic film or a laminated sheet of a hydrophobic nonwoven fabric and a plastic film, preferably with a breathable but liquid-impervious sheet. It is also possible to form the backsheet and the leak-barrier sheets using composite nonwoven fabric consisting of a melt blown nonwoven fabric having a high water-resistance and two layers of a spun bond nonwoven fabric having high strength and flexibility sandwiching the melt blown nonwoven fabric.

The first full paragraph on page 19 has been amended as follows:

The nonwoven fabric may be selected from a group including spun lace-, needle punch-, melt blown-, thermal bond-, spun bond-, chemical bond- and air through-nonwoven fabrics. Component fiber of the nonwoven fabric may be selected from a group including [polyolefine-] polyolefin-, polyester- and polyamide-based fibers and polyethylene/polypropylene or polyethylene/polyester core-sheath type conjugated fiber and side-by-side-type conjugated fiber.

The last paragraph beginning on page 20 and continuing on page 21 has been amended as follows:

[The] According to the body fluid absorbent panel [according to this] of the present

invention, [is characterized in that] the barrier comprises the shape keeping layer in which the synthetic resin fibers are hot welded together at contact points of these fibers and the body fluid retaining layer in which the synthetic resin fibers are hot welded together at contact points of these fibers. This unique arrangement ensures the synthetic resin fibers to restrict themselves against any relative movement of these fibers so that the layers may be prevented from being collapsed. Even when these layers are more or less collapsed under a pressure exerted thereon in their thickness directions, the layers can restore their initial thickness. If the panel has not an adequate compression modulus to restore a desired thickness dimension after it has been collapsed, the volume of the barrier would be unacceptably reduced and its absorbing capacity for body fluids such as loose passage or menstrual discharge would be correspondingly reduced. The panel according to this invention effectively solves this problem by the unique construction of the barrier which is not readily collapsed and, even when it has been more or less collapsed, able to restore a sufficient thickness dimension to maintain a desired absorbing capacity for body fluids.

Changes Made to Claims

Claim 1 has been amended as follows:

1. (Amended) A body fluid absorbent panel for a sanitary wearing article comprising [made of] a fibrous web having a compression resilience, said fibrous web [having] comprising a plurality of openings extending therethrough in a direction of [its] a thickness of the fibrous web, and [a] barriers surrounding and defining said openings, [wherein:]

said [barrier comprises] barriers comprising a shape keeping layer formed [with] from a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer placed upon one of an upper surface and a lower surface of said shape holding layer and formed [by] from a

plurality of thermoplastic synthetic resin fibers mixed with an absorbent [material; and] material.

said synthetic resin fibers [are] being hot welded together at contact points [of these fibers] thereof in said shape keeping layer as well as in said body fluid retaining layer [and, along an interface of said shape keeping layer and said body fluid retaining layer,] and said synthetic resin fibers of said [layers are] shape keeping layer and said body fluid retaining layer being hot welded together along an interface at contact points of said [fibers.] synthetic resin fibers.

Claim 2 has been amended as follows:

2. (Amended) The body fluid absorbent panel according to Claim 1, wherein said absorbent material comprises a hot weldable high absorbent polymer component in the form of at least one of [hot weldable] high absorption polymer particles [and/or] and a plurality of liquid-absorbent fibers made of high absorption polymer, [so that] said synthetic resin fibers and said [polymer particles are] high absorbent polymer component being hot welded together at contact points thereof in said body fluid retaining layer and [wherein] said synthetic resin fibers of said shape keeping layer and said [polymer grains] high absorbent polymer component of said body fluid retaining layer [are] being hot welded together at contact points thereof along said interface of said shape keeping layer and said body fluid retaining layer.

Claim 3 has been amended as follows:

3. (Amended) The body fluid absorbent panel according Claim 1, wherein said [barrier] barriers comprises a plurality of first barriers extending in parallel to and spaced apart from one another in a first direction and a plurality of second barriers extending in parallel to and spaced apart from one another in a second direction intersecting said first [barrier] barriers and each of the openings is defined by a pair of [the] adjacent first barriers and a pair of [the] adjacent second

barriers intersecting [said] a pair of [the] adjacent first barriers.

Claim 4 has been amended as follows:

4. (Amended) The body fluid absorbent panel according to Claim 1, [wherein] comprising at least two of said panels which are placed upon each other in [said] a thickness direction [of thickness] so that [each of the] openings formed in upper one of said panels [is] are divided by [the barrier] at least in two sections by barriers formed in [the] a panel immediately underlying said upper one of said panels. [at least in two sections.]

Claim 5 has been amended as follows:

5. (Amended) The body fluid absorbent panel according to Claim 1, wherein an open area ratio of said openings to said panel is in a range of [20 ~ 80%] from about 20 to about 80% and a total area of said openings is in a range of [10 ~ 1600mm²] from about 10 to about 1600 mm². [and wherein a total area of said openings in said upper panel and a total area of said openings in the panel immediately underlying said upper panel are in a relationship of the upper panel £ the panel immediately underlying said upper panel.]

Claim 6 has been amended as follows:

6. (Amended) The body fluid absorbent panel according to Claim 1, wherein a compression resilience of said [barrier] barriers is in a range of [(a thickness under a load of 35g/cm²) ÷ (a thickness under a load of 2g/cm²) x 100 = 20 ~ 80%.] from about 20 to about 80%.

Claim 7 has been amended as follows:

7. (Amended) The body fluid absorbent panel according to Claim 1, wherein a ratio between said shape keeping layer and said body fluid retaining layer with respect to a dimension of said [barrier] barriers as measured in its thickness direction is [in a relationship of (shape keeping layer) 6 : 4 (body fluid retaining layer) ~ (shape keeping layer) 8 : 2 (body fluid retaining layer).] in a range of 6:4 to 8:2.

Claim 8 remains unchanged.

Claim 9 has been amended as follows:

9. The body fluid absorbent panel according to Claim 1, wherein a mat-like liquid-absorbent core substantially without any openings is provided on a lower surface of [a lowermost one of said panels.] said panel.

New Claim 10 has been added as follows:

- 10. The body fluid absorbent panel according to Claim 4, wherein an open area ratio of said openings to said panel is in a range of from about 20 to about 80% and a total area of said openings is in a range of from about 10 to about 1600 mm² and wherein a total area of said openings in said upper panel are less than or equal to a total area of said openings in the panel immediately underlying said upper panel.- -

New Claim 11 has been added as follows:

-11. The body fluid absorbent panel according to Claim 1, wherein a mat-like liquid-absorbent core substantially without any openings is provided on a lower surface of a lowermost one of said panels.- -

Changes Made to Abstract

The abstract has been amended as follows:

A body fluid absorbent panel including openings and a barrier which comprises, in turn, a shape keeping layer formed with a plurality of thermoplastic synthetic resin fibers and a body fluid retaining layer formed with a plurality of thermoplastic synthetic fibers mixed with an absorbent material. [, wherein the] The synthetic resin fibers are hot welded together at contact points of these fibers in the shape keeping layer as well as in the body fluid retaining layer. [and the] The synthetic resin fibers of [these layers] the shape keeping layer and the body fluid retaining layer are also hot welded together at contact points of these fibers along an interface of the shape keeping layer and the body fluid absorbent layer.